### (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

# (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 13 January 2005 (13.01.2005)

**PCT** 

### (10) International Publication Number WO 2005/002802 A1

(51) International Patent Classification7:

B25D 9/06

(21) International Application Number:

PCT/FI2004/000429

(22) International Filing Date:

6 July 2004 (06.07.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 20031035

7 July 2003 (07.07.2003)

(71) Applicant (for all designated States except US): SAND-VIK TAMROCK OY [FI/FI]; Pihtisulunkatu 9, FI-33330 Tampere (FI).

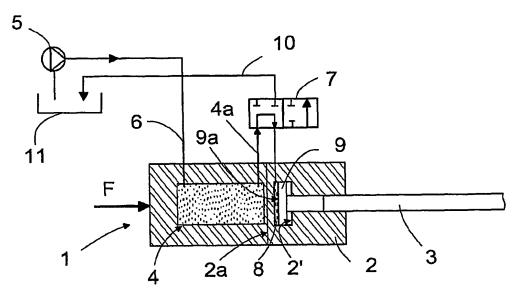
(72) Inventors; and

(75) Inventors/Applicants (for US only): KESKINIVA, Markku [FI/FI]; Pikkusaarenkuja 5 B 32, FI-33410 Tampere (FI). MÄKI, Jorma [FI/FI]; Sorvajärventie 35, FI-34140 Mutala (FI). ESKO, Mauri [FI/FI]; Kolkontie 174, FI-39500 Ikaalinen (FI). AHOLA, Erkki [FI/FI]; Topiaksentie 11, FI-36240 Kangasala (FI). HELIN, Aimo [FI/FI]; Lannemäentie 49 F 14, FI-33340 Tampere (FI). MUUTTONEN, Timo [FI/FI]; Omenapolku 13, FI-37200 Siuro (FI).

- (74) Agent: KOLSTER OY AB; Iso Roobertinkatu 23, P.O. Box 148, FI-00121 Helsinki (FI).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: IMPACT DEVICE AND METHOD FOR GENERATING STRESS PULSE THEREIN



(57) Abstract: A pressure fluid operated impact device comprising a frame (2) whereto a tool (3) is mountable movably in its longitudinal direction, and control means (7) for controlling pressure fluid feed to the impact device (1), as well as a method of generating a stress pulse in a pressure fluid operated impact device. The impact device (1) comprises a working chamber (8) and a transmission piston (9) moving therein. Energy charging means for charging energy of pressure fluid and the control means are coupled to allow periodically alternately pressure fluid to flow to the working chamber (8) and, correspondingly, to discharge pressure fluid from the working chamber (8). In the method, pressure fluid is fed to the working chamber (8), which produces a force pushing the transmission piston (9) in the direction of the tool (3), thus generating a stress pulse in the tool (3).

## WO 2005/002802 A1



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### **Declarations under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ,

BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

of inventorship (Rule 4.17(iv)) for US only

#### Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.